XIV. *A Deſcription of a* Clepſydra *or Water-Clock, by the Hon.* Charles Hamilton, *Eſq*;.

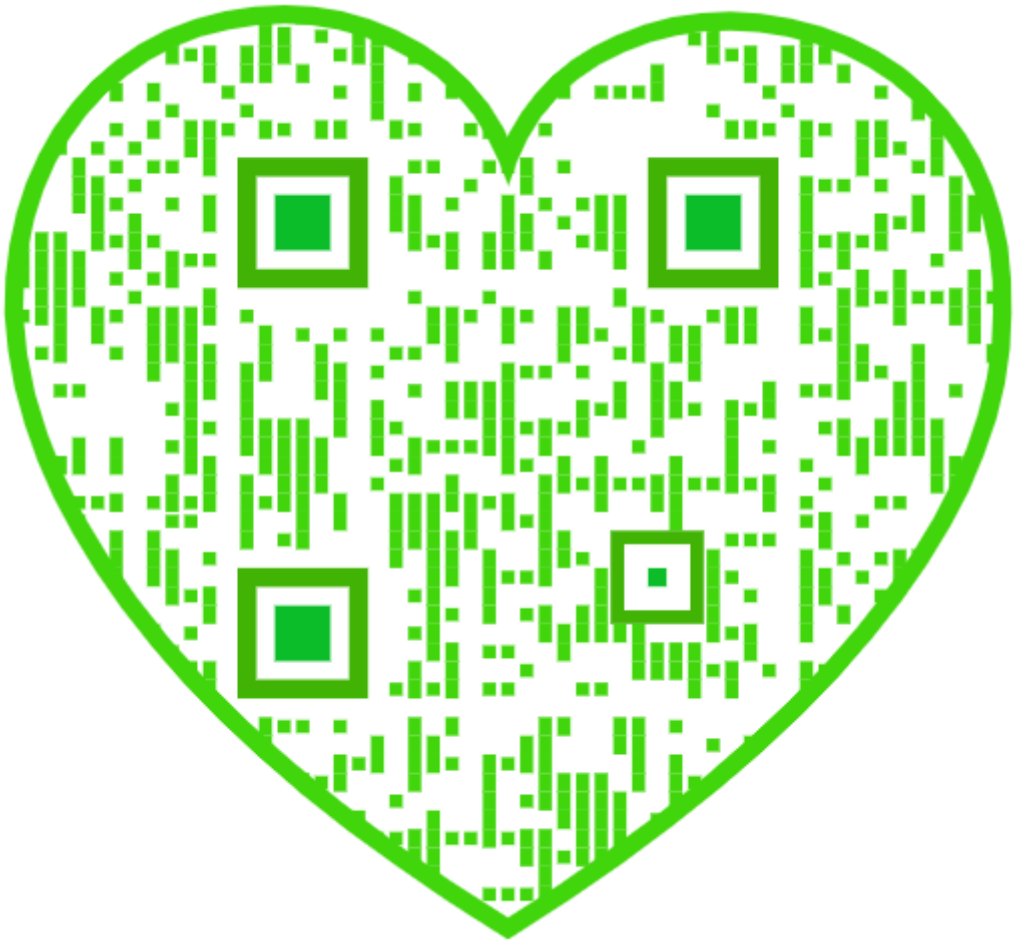
See TAB. III. * *Fig.* 1. this Machine in Perſpective.

Read April 24. 1745.

AN open Canal *e e*, is ſupplied with a conſtant and equal Stream by the Siphon *d*; and has at each End *ff*, open Pipes, of exactly equal Bores, which deliver the Water that runs along the Canal *e*, alternately into the Veſſels *g* 1, *g* 2, in ſuch a Quantity as to raiſe the Water from the Mouth of the *Tantalus*, *s*, to the Top of the *Tantalus t*, exactly in an Hour. The Canal *e e*, is equally poiſed by the two Pipes *f* 1, *f* 2, upon a Centre *r*; the Ends of the Canal, *e*, are raiſed alternately, as the Cups *z z*, are depreſſed, to which they are connected by Lines running over the Pulleys *l l*. The Cups, *z z*, are fixed at each End of the Balance *m m*, which moves up and down upon its Centre *v*.

n 1, *n* 2, The Edges of two Wheels or Pulleys, moving different Ways alternately, and ſo fitted to the Cylinder *o* (by oblique Teeth both in the Cavity of the Wheel, and upon the Cylinder; which, when the Wheel *n* moves one Way [*i. e.* in the Direction of the Minute-Hand], meet the Teeth of the Cylinder, and carry the Cylinder with it; and, when *n* moves the contrary Way, ſlip over thoſe of the Cylinder, the Teeth no more meeting, but receding from each other; or it may be done by Catches or Locks, which require a longer Deſcription), one or other of theſe Wheels, *n n*, continually moves *o* in the

* *N. B.* The *Letters* of Reference anſwer to all the 3 *Figures*; ſome being ſeen in one, that do not come in Sight in the others. *C. M.*



the ſame Direction, with an equal and uninterrupted Motion: For the Contrivance is ſuch, that the Inſtant one ceaſes to act, the other begins, and ſo on.

A fine Chain goes twice round each Wheel, having at one End a Weight, *x*, always out of Water, which equiponderates with *y* at the other End, when kept floating at the Surface of the Water in the Veſſel *g*, which *y* muſt always be. The two Cups *z z*, one at each End of the Balance *m m*, keep it in *Equilibrio*, till one of them is forced down by the Weight and Impulſe of the Water, which it receives from the *Tantalus s t i:* Each of theſe Cups *z z*, has likewiſe a *Tantalus* of its own *h h*, which empties it after the Water has done running from *g*, and leaves the two Cups again *in Æquilibrio*; *q* is a Drain to carry off the Water.

Fig. 2.

The Front of the Clepſydra

Repreſents the Dial-Plate, with the Hour and Minute-Hands, the Weight and Float belonging to *n* 2. The Front of the *Tantalus* in *g* 2, marked *s t i*, of which *s* the Mouth is 18 Inches above the Bottom of the Veſſel *g*, and 18 Inches below the Top of the *Tantalus t*. *i* is the iſſuing Leg of the *Tantalus*, which diſcharges the Water out of the Veſſel *g* into the Cup *z*, as ſoon as it runs over the Top *t*, till the Water ſinks as low as *s*.

Fig. 3.

The Profile of the Clepſydra.

TAB. IV. *or Fig.* 4.

The Plan of the Clepſydra *to its full Dimenſion.*

The Caſe *u u* incloſes the whole Machine, except the Ciſtern that ſupplies the Siphon *d*, which may be placed at any Diſtance from it, as is moſt convevenient, provided the iſſuing Leg *d*, of the Siphon is lengthened out ſo as to give a conſtant Stream into the Canal *e*. This Caſe *u u* ſupports the *Axis* of the Cylinder *o* behind, and the Dial-Plate *p p* before; in the Centre of which turns the *Axis o*, with the Index *k* at its Extremity, being the Minute-Hand. The Hours may be deſcribed by two common Wheels, as in ordinary Clock-work. For cheap Work, Chains paſſing round Pulleys would do inſtead of Wheels with Teeth.

The Motion of the Clepſydra *is effected in the following Manner:*

The ſhort Leg of the Siphon *d* is placed in a Ciſtern, with its Mouth ſomething below the Mouth of the Waſte-Pipe; which Ciſtern is ſupplied with a conſtant Stream, rather more than runs out at the Siphon *d*; which Overplus going off at the Waſte-Pipe, the Water always remains at the ſame Height in the Ciſtern, and yet always delivers a conſtant and equal Flow into the Canal *e e*; conſequently, there is not the leaſt Intermiſſion. As the End of the Canal *e*, fixed to the Pipe *f* 1, is in the Figure the loweſt, the Water runs all thro' the Pipe *f* 1, into the Veſſel *g* 1, till it runs over the Top of the *Tantalus t*; when it immediately runs out at *i* into the Cup *z*,

at

at the End of the Balance *m*, and forces it down, the Balance *m* moving on its Centre *v*. When one Side of *m* is brought down, the String which connects it to *f* 1, running over the Pulley *l*, raiſes the End *f* 1, of the Canal *e*, (which turns upon its Centre *r*,) higher than *f* 2; conſequently, all the Water which conſtantly runs thro' the Siphon *d*, inſtantly runs thro' *f* 2 into *g* 2, till the ſame Operation is performed in that Veſſel, and ſo on alternately.

As the Height the Water riſes in *g* in an Hour, *viz.* from *s* to *t*, is equal to the Circumference of *n*, the Float *y* riſing that Height along with the Water, lets the Weight *x* act upon the Pulley *n*, which carries with it the Cylinder *o*; and, giving a Revolution, makes the Index *k* deſcribe an Hour upon the Dial-Plate. This Revolution is performed by the Pulley *n* 1; the next is to be by *n* 2, whilſt *n* 1 goes back, as the Water in *g* 1 runs out thro' the *Tantalus*; for *y* muſt follow the Water, as its Weight increaſes out of Water.

The *Axis o* always keeps moving the ſame Way; the Index *k* deſcribes the Minutes; the *Tantalus's* muſt be wider than the Siphon *d*, that the Veſſels *g g* may be ſure to be empty as low as *s*, before the Water returns to them.

Printed for C. DAVIS, over-againſt *Gray's-Inn Gate* in *Holbourn*, PRINTER to the ROYAL SOCIETY, M.DCC.XLVII.

Fig. 3. p. 172.

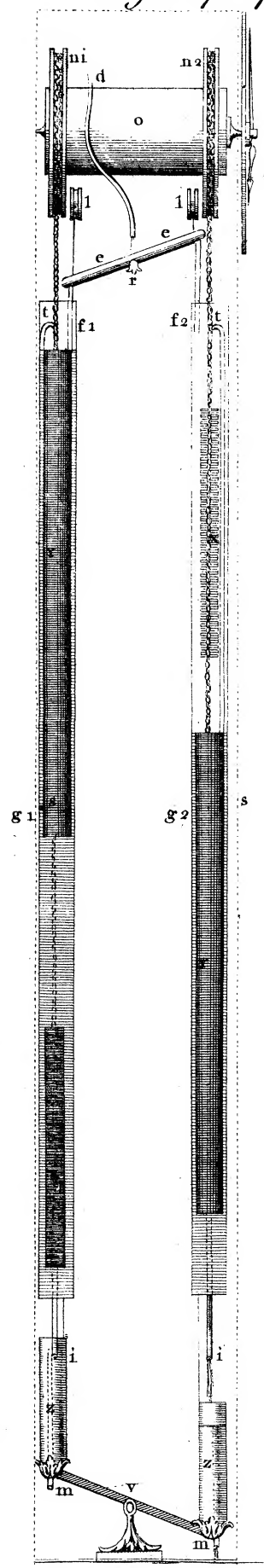


Fig. 1. p. 171.

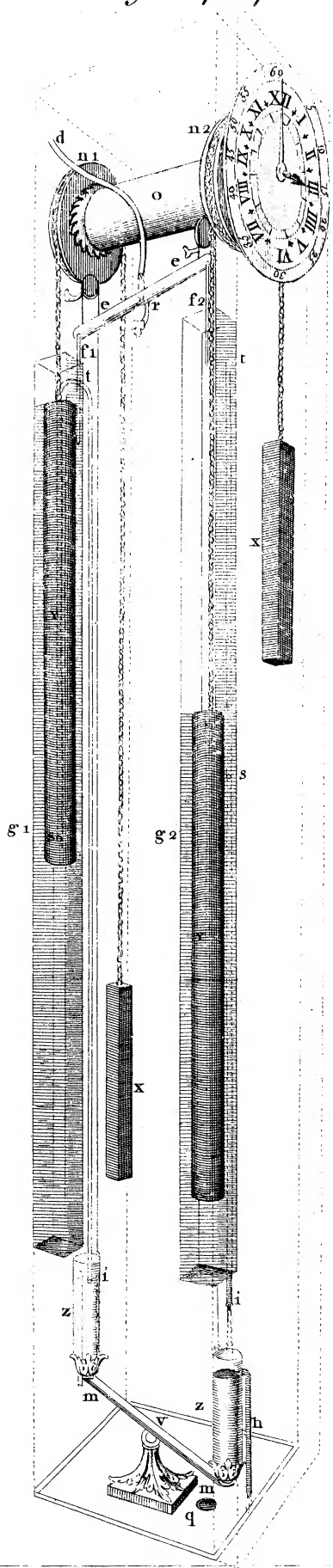
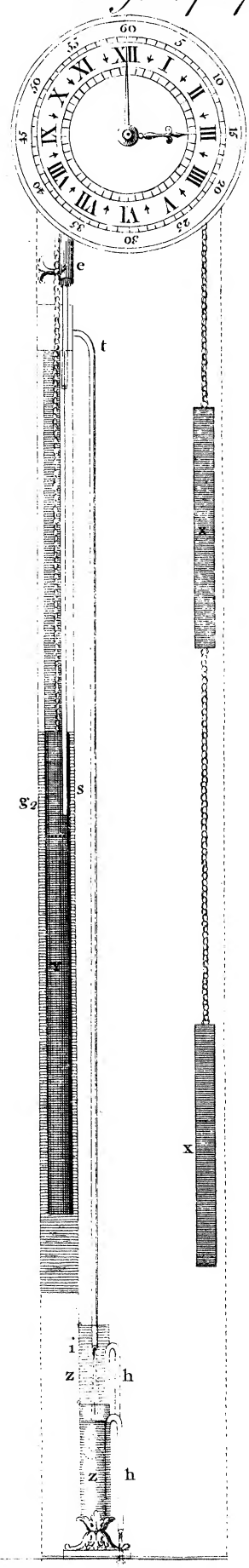


Fig. 2. p. 172.



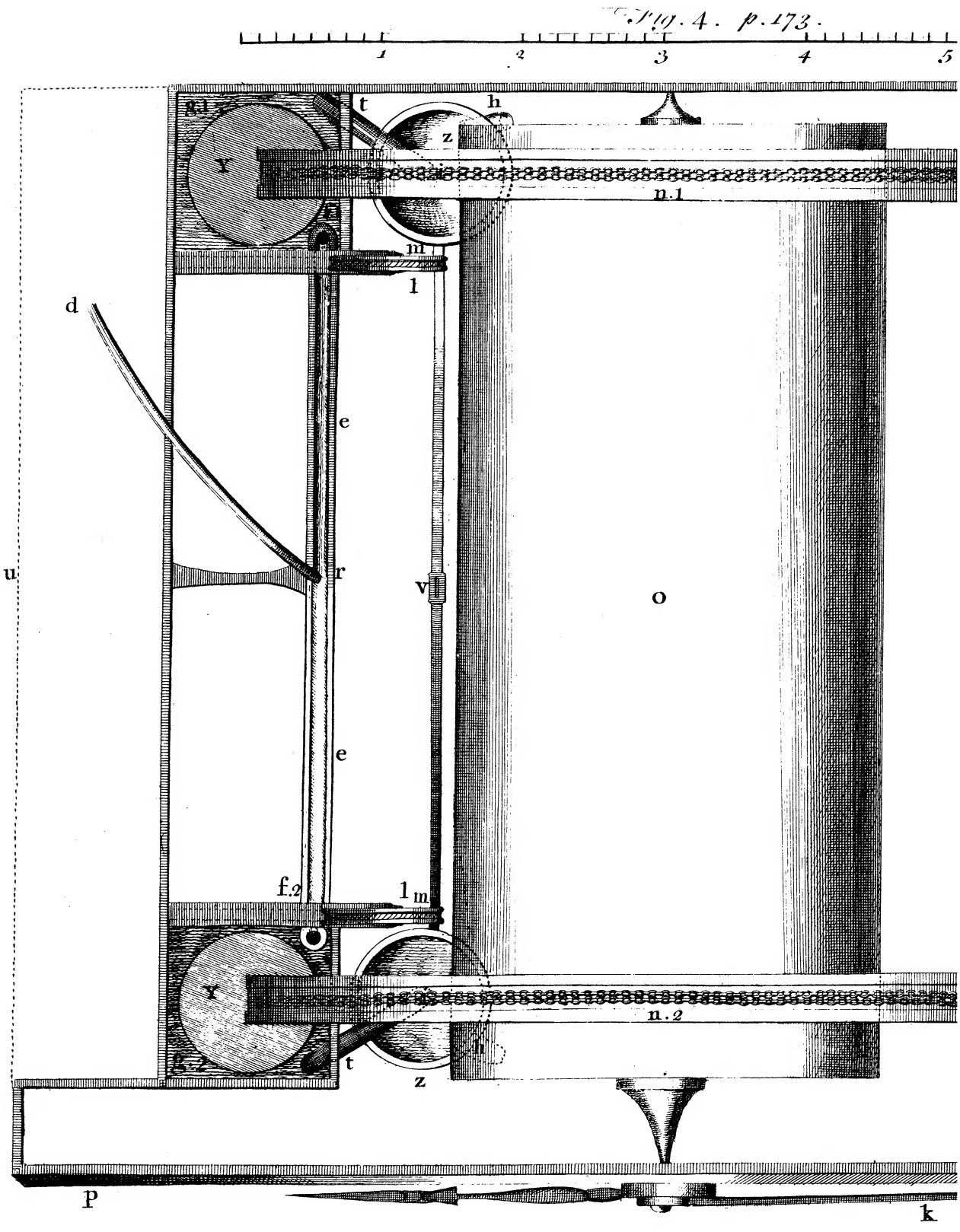
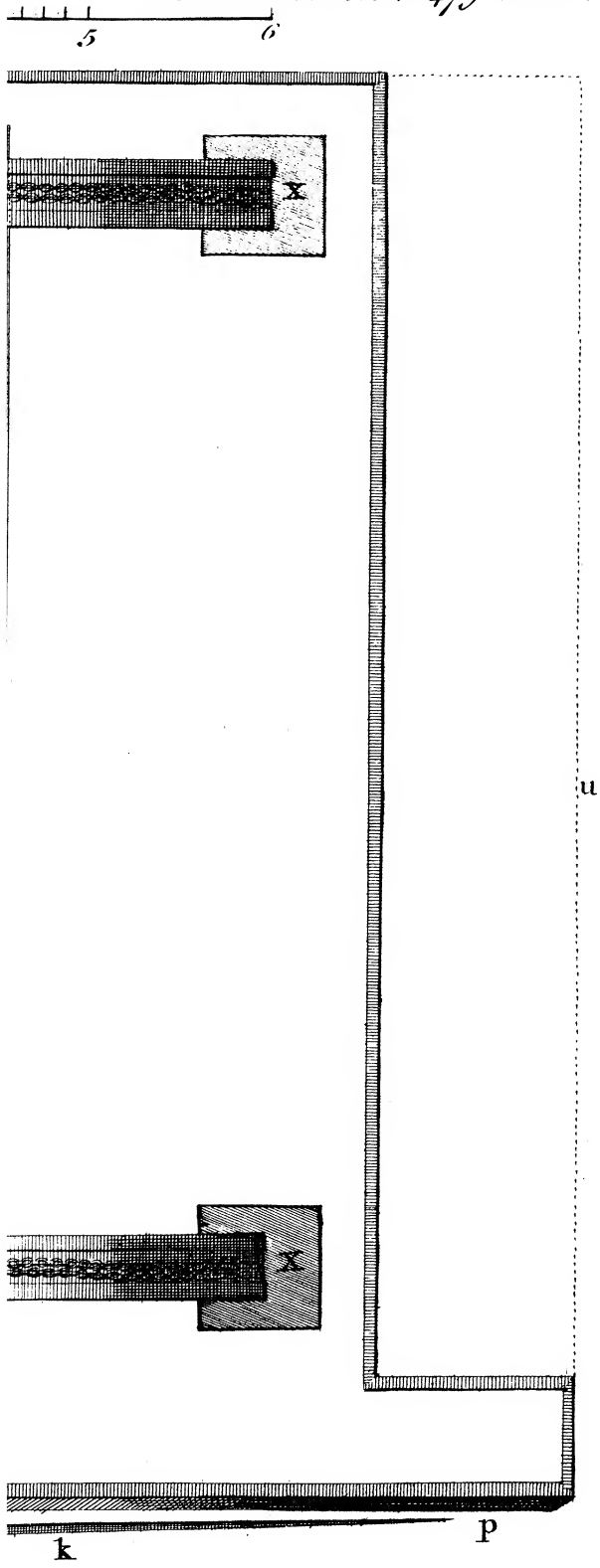
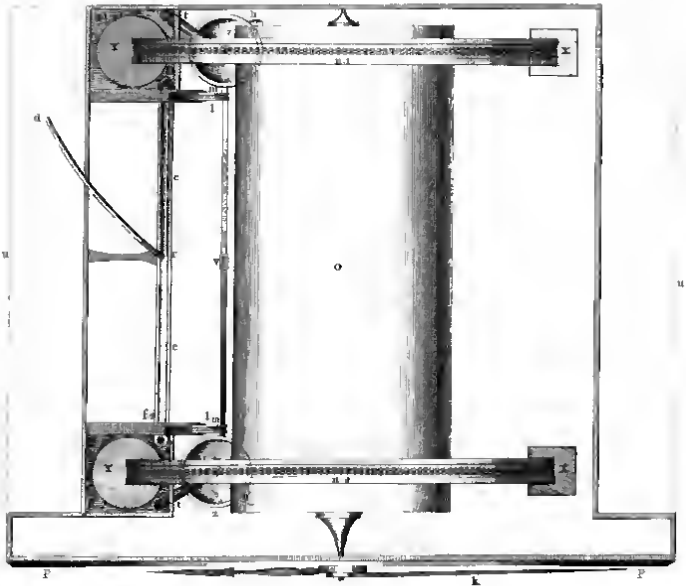


Fig. 4. p. 173.
1
2
3
4
5
g.1
t
h
z
Y
n.1
m
l
d
e
u
r
v
o
e
f.2
l m
Y
n.2
g.2
t
h
z
p
k


5
6
x
u
x
k
p


a
b
c
d
e
f
g
h
i
k
l
m
n
o
p
q
r
s
t
u
x
y
z